APPENDIX

Changes to the Specification:

The following is a marked-up version of the amended paragraphs:

[0031] Returning to FIG. 1, the portable electronic device preferably includes a hardware interface port 4 such as a 120-pin or 120-receptacle connector to provide an interface between the plug-in module and the electronic device. The adapter module 2 mates with the hardware interface [module] port 6 of the electronic device via a hardware interface connector that is included with the adapter module. The adapter module 2 and/or the device 5 preferably includes a means to secure the module 2 to the device 5. For example, FIG. 1 illustrates that one or more latches 7 may be provided to secure the module 2 to the electronic device 5 during normal operation.

[0032] The electronic device illustrated in FIG. 1 is a portable engine analyzer, such as that which may be used to measure and analyze various aspects of the operation of a vehicle. However, the electronic device may in fact be any type of analyzer or other type of portable electronic or computing device such as a pocket PC or a personal digital assistant, a remote control, an electronic game, or any other portable electronic device. In the embodiment of an engine analyzer, the analyzer may serve to collect and analyze multiple aspects of an engine or vehicle, including aspects of the vehicle operations such as emissions components, system pressure, fluid pressure, system temperature, and other aspects or conditions. However, the analyzer or other electronic device may be equipped with additional functionality[, such as the ability to measure amps, vibration, or other aspects and display the measurements in graphic form, much as an oscilloscope].

[0033] FIG. 2 illustrates the internal components of an exemplary electronic device. Such components may interface with the module through the hardware interface port. Referring to FIG 2, a hardware interface connector of an exemplary oscilloscope adapter module 20 interfaces with a hardware interface port 22. Certain pins or receptacles on the hardware interface port 22 provide communication to and from a controller 24 via interface bus 26 within the portable electronic device. The hardware interface port 22 may also serve to communicate discrete input/output signals via interface bus 26 to the oscilloscope module through the hardware interface connector 20, and the oscilloscope module 20 may share input/output signals 28 and/or 30 with one or more field programmable gate array (FPGA) components within the electronic device such as 32 and/or 34. The device may also include a memory or buffer 36 that stores data collected by the device.

[0034] To provide an oscilloscope adapter module for an electronic device, the module may include a computer program memory or other carrier, such as a floppy disc, a CD-ROM, a virtual memory, or a signal, containing computer program instructions that instruct the electronic apparatus to perform such functions. These instructions are preferably loaded into the electronic device when the oscilloscope application is selected. Optionally, the module may also provide processing hardware that can be used by the electronic device when performing such functions. Preferably, the module includes a custom-programmed [FGPA] FPGA or other circuitry to provide some or all processing functions, such as timing, sampling, and/or analog-to-digital converter functions. Such memory, circuitry, and/or processing hardware may be included in the module itself, or optionally the module may simply contain communications hardware that provides an interface between the hardware interface port of the portable electronic device and an external memory or processor.

[0044] When used in connection with a portable electronic engine analyzer, the module and analyzer may be used to diagnose problems with vehicle systems such as automotive engines. In a apparatus of this type, the analyzer, or optionally the module, includes several leads or test probes that a mechanic or other technician may attach to various components of a vehicle. The analyzer will use these probes to gather various types of information while the mechanic or technician performs certain actions such as maintaining the engine under load or starting the engine. The results of such tests, and knowledge about the vehicle or engine type, trouble symptoms, allowable limits, and other data, can lead to a diagnosis of a problem. Diagnosis usually points to some corrective action such as the replacement of parts or the performance of system adjustments by the mechanic.

Changes to claims:

The following is a marked-up version of the amended claims:

8.   (Amended)   A method of causing an electronic device to function as an oscilloscope, comprising:

connecting an adapter module to a hardware interface port of a portable electronic device having a processor, a display, and a memory;

delivering computer program instructions from the module to a processor for the electronic device;

collecting, using a plurality of leads connected to the electronic device, data representative of [an] and signal from an external source;

displaying, in response to the computer program instructions, the data on the display as a waveform comprising individual data values as a function of time on a graph having a vertical axis and a horizontal axis, each axis having a scale.

Changes to the Abstract:

The following is a marked-up version of the amended Abstract.

An oscilloscope adapter for a portable electronic device includes a hardware interface connector and a computer program memory. The memory stores computer program instructions that [to] direct the electronic device to [collecting] collect data representative of [an] a signal from an external source and [displaying] displaying the data as a waveform comprising individual data values as a function of time. The user may select one or more of the scales of the graph. The adapter also may include one or more of a model waveform database, a collected waveform database, an application-specific database, and a language database.